Executive Summary

This summary provides a brief overview of the Bel Marin Keys Unit V (BMKV) Expansion of the Hamilton Wetland Restoration Project (HWRP); project goal and objectives; restoration alternatives; environmental consequences of the proposed project; public issues and areas of controversy; evaluation of the alternatives in terms of the project goals and objectives; and a description of the process for selecting the preferred alternative.

Project Overview

The U.S. Army Corps of Engineers, San Francisco District (Corps) and the California State Coastal Conservancy (Conservancy), in collaboration with the San Francisco Bay Conservation and Development Commission (BCDC), are proposing to restore tidal salt marsh and other wetland habitat at the BMKV property as an expansion of the Hamilton Wetland Restoration Project (HWRP).

The authorized HWRP includes the Hamilton Army Airfield (HAAF) parcel, the Navy Ballfields parcel, and the State Lands Commission (SLC) parcel. For this document, reference to the HAAF parcel includes reference to the Navy Ballfields parcel.

The final environmental report/environmental impact statement (EIR/EIS) for the HWRP was issued in 1998, and the project was authorized in the federal Water Resources Development Act (WRDA) in 1999. The final EIR/EIS for the HWRP contained a programmatic-level analysis of wetland restoration at the BMKV property. At the time of the conceptual design, EIR/EIS, and authorization of the HWRP, the BMKV site was privately owned. The Conservancy purchased the BMKV site in 2001 with the intent of proposing wetland restoration on the site.

This supplemental EIR/EIS (SEIR/EIS) analyzes the environmental impacts of restoring the BMKV site as an expansion of the HWRP.

The purpose of the BMKV Expansion is to restore important tidal wetland habitat in San Francisco Bay. Approximately 90% of the original tidal wetlands of San Francisco Bay have been destroyed. This destruction is the result of the diking and filling of the tidal wetlands for purposes of agriculture, urban development, and salt production. This loss of tidal wetlands has greatly reduced the amount

of habitat available to many species of fish and wildlife. Several local animal and plant species, including the salt marsh harvest mouse and the California clapper rail, have been listed as endangered as a direct result of the reduction in extent and quality of their wetland habitats. Many other species, including migratory birds and numerous fish species also have been affected by this loss of habitat. Restoration of tidal salt marsh habitat at the BMKV property represents the implementation of the local, regional, and national planning efforts listed below.

- The Hamilton Wetland Restoration Project
- The San Francisco Bay Plan
- The Long-Term Management Strategy for Disposal of Dredged Material in San Francisco Bay (LTMS)
- The San Francisco Estuary Project Comprehensive Conservation and Management Plan
- The Ecosystem Restoration Program Plan
- The San Francisco Estuary Baylands Ecosystem Goals Project
- The Marin Countywide Plan
- The City of Novato General Plan
- The Bay Trail Plan
- The Oakland Harbor Navigation Improvement (50-Foot) Project
- The Defense Base Closure and Realignment Act of 1988

These plans are described in chapter 2, *Purpose and Need.*

Separate Remedial Processes

In addition to and separate from the BMKV expansion, there are remedial processes currently underway for areas of identified contamination at the HAAF and SLC parcels. Remedial issues at the HAAF (including Navy Ballfields) parcel are being addressed through the Base Realignment and Closure (BRAC) process. Remedial issues at the SLC parcel are being address through the Formerly Used Defense Site (FUDS) remedial process.

The BMKV expansion makes no determinations regarding potential remedial activities at the HAAF or SLC parcels. The BMKV expansion assumes that the BRAC and FUDS processes will result in implementation of remediation of the parcels to a suitable condition for the proposed wetlands reuse generally in accordance with the present HWRP design. If the remedial determinations ultimately made through BRAC or FUDS require changes in the wetland designs proposed for the HAAF or SLC parcels, the BMKV and HWRP lead agencies

would evaluate the potential effects of the changes and determine whether additional National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) compliance would be necessary. Currently, the lead agencies consider it speculative to assume that the BRAC or FUDS process will not result in remedial options that leave the sites in a suitable condition for the proposed wetland reuse.

Goal and Objectives

The project goals and objectives presented in this section are the same as those that were developed for the HWRP. The goals and objectives are the same because the project is being considered as an expansion of the authorized HWRP.

Project Goal

The goal of this project is to create a diverse array of wetland and wildlife habitats at the BMKV and HAAF sites that benefit endangered species as well as other migratory and resident species.

Project Objectives

- To design and engineer a restoration project that stresses simplicity and has little need for active management.
- To demonstrate the beneficial use of dredged material, if feasible.
- To recognize existing opportunities and constraints, including the runway and remediation of contaminated areas of the HWRP, as integral components of design.
- To ensure no net loss of wetland habitat presently provided at the BMKV and HAAF sites.
- To create and maintain wetland habitats that sustain viable wildlife populations, with particular emphasis on supporting Bay Area special-status species.
- To include buffer areas along the upland perimeter of the project area, especially adjacent to residential areas, so wildlife will not be impacted by adjacent land uses.
- To be compatible with adjacent land uses and wildlife habitats.
- To provide for public access that is compatible with protection of resource values and with regional and local public access policies.

Restoration Alternatives

The project objectives could be attained by restoring wetlands, either through the process of natural sedimentation or by actively placing dredged material on the site. The currently authorized HWRP will restore wetlands and other habitats on an approximately 950-acre site to the south and southeast of the BMKV parcel.

Three alternatives to expand the HWRP are evaluated in this SEIR/EIS. The No-Action Alternative is also described in this SEIR/EIS and serves as a baseline condition from which to evaluate the environmental impacts of the 3 restoration alternatives. The 3 restoration alternatives analyzed in this SEIR/EIS are summarized in table ES-1 below. Other alternatives and alternative features considered but not analyzed in this document are described in chapter 3.

Table ES-1. BMKV Expansion Alternatives Considered in this SEIR/EIS

	Alternative 1	Revised Alternative 2 (Preferred Alternative)	Alternative 3
Descriptive Name	Dredged Material Placement with Enlarged Pacheco Pond	Dredged Material Placement with Seasonal Wetlands and Enlarged Pacheco Pond	Natural Sedimentation with Enlarged Pacheco Pond
Dredged Material Use	Additional 13.2 million cubic yards above HWRP	Additional 13.8 million cubic yards above HWRP	None at BMKV; 2.6 million cubic yards less than HWRP.
Habitats	1039 acres tidal wetland 147 acres subtidal and tidal mudflat habitats 40 acres seasonal wetland 10 acres emergent wetland 40 acres open water (pond) 300 acres upland	899 acres tidal wetland 120 acres subtidal and tidal mudflat habitats 277 acres seasonal wetland 12 acres emergent wetland 21 acres of open water (pond) 247 acres upland	1,274 acres tidal wetland 197 acres subtidal and tidal mudflat habitats 10 acres emergent wetland 40 acres open water (pond) 55 acres upland
Outboard Levee Breaches	Novato Creek San Pablo Bay (2)	Novato Creek San Pablo Bay	San Pablo Bay (2)
New Levees	From Pacheco Pond to Novato Creek; along east side of expanded Pacheco Pond	From Pacheco Pond along east side of expanded pond; along northeast and southwest sides of seasonal wetland ; along east side of seasonal wetland northeast to Novato Creek	Along east side of Pacheco Pond; from enlarged Pacheco Pond to BMK south lagoon and along BMK south lagoon to Novato Creek.

	Alternative 1	Revised Alternative 2 (Preferred Alternative)	Alternative 3
Improved Levees	BMK south lagoon	BMK south lagoon; portion of BMKV/HAAF berm east of the seasonal wetland; portion of levee west of BMK south lagoon lock	Western portion of BMK south lagoon
Hydrologic Connections	Culverts with flapgates at Pacheco Pond; modified BMK lagoon overflow weirs; culvert with flapgate in Novato Creek levee	Overflow structure from Pacheco Pond to seasonal wetland; overflow structure from seasonal wetland to tidal wetland area; modified BMK lagoon overflow structures into swale; culvert with flapgate from swale into Novato Creek	Culverts with flapgates at Pacheco Pond; pump station near BMK south lagoon lock
Proposed Bay Trail Routes, Spur Trail Options, and Interpretive Center/Access Area Location	South and north from City levee and along west side of Pacheco Pond to BMK Blvd. Option 1A along central levee to Novato Creek. Interpretive center/access area on property currently owned by the City of Novato west of the HWRP.	South and north from City levee, around east side of expanded Pacheco Pond to BMK Blvd around west side of Headquarters Hill. Interpretive center/access area on property currently owned by the City of Novato west of the HWRP.	South and north from City levee, around east side of expanded Pacheco Pond to BMK Blvd. Option 3A along new levee just south of BMK south lagoon levee to Novato Creek. Interpretive center/access area on northwest part of BMKV.
Novato Sanitary District Outfall	Authorized HWRP included relocation of dechlorination plant and retrofit/replacement of existing pipeline. Alt. 1 includes extension of new pipeline around east side of Pacheco Pond, and access road/berm.	Authorized HWRP included relocation of dechlorination plant and retrofit/replacement of existing pipeline. Revised Alt. 2 includes extension of new pipeline around east side of expanded pond and access road/berm.	Authorized HWRP included relocation of dechlorination plant and retrofit/replacement of existing pipeline. Alt. 3 includes extension of new pipeline around east side of Pacheco Pond, and access road/berm.

The 3 alternatives include the addition of the BMKV expansion area itself, as well as the following potential changes to the authorized HWRP.

- Elimination of a separating levee between the BMKV and SLC sites
- Replacement of the barrier levee between BMKV and HAAF with an access berm for the NSD line
- Extension of the Bay Trail southward and northward from the City of Novato levee
- Potential use of diesel unloading and booster pumps for offloading dredged material

- Potential alternative alignment of pipeline directly from the offloading facility to the BMKV site (Alternatives 1 and 2)
- Change in location of and increase in high transitional marsh acreage on the SLC parcel
- Relocation of the tidal breach on SLC to BMKV (Alternatives 2 and 3)
- Addition of new NSD pipeline around east side of expanded Pacheco Pond

Environmental Consequences

This SEIR/EIS evaluates the environmental consequences of the restoration alternatives. A summary of the impact analysis for these alternatives is presented at the end of this chapter (table ES-2). In addition, CEQA and NEPA require a review of other issues summarized below.

Significant Unavoidable Effects

For the proposed BMKV expansion, this Draft SEIR/EIS identifies several potentially significant impacts that may not be mitigated to a less-than-significant level.

There is a potential for an increase of methylmercury production due to the increase of tidal wetland acreage in contact with sediments containing mercury. These sediments include those that might be dredged sediments placed on the site (Alternative 1 and Revised Alternative 2) and natural sedimentation from Novato Creek or San Pablo Bay (all alternatives). While the project would only accept dredged material that meets cover criteria (Alternative 1 and Revised 2), methylmercury production in tidal wetlands is poorly understood at present, and the cover criteria are for total mercury, not methylmercury. An adaptive management strategy concerning this impact is proposed in the *Water Quality* section of the document. However, because scientific understanding of this impact is insufficient to provide a definitive conclusion regarding the significance of the impact and the potential efficacy of mitigation, this impact is currently assumed to be significant and unavoidable.

The offshore unloading facility and booster pump platforms for unloading of dredged material could be built on piles that need to be pile-driven. Pile-driving equipment can produce localized noise that can affect listed fish species and marine mammals in areas immediately adjacent to the pile-driving activities. While population-level impacts are not expected, construction may result in mortality of individual fish and harassment of individual marine mammals present in the immediate vicinity of pile-driving activity. This impact is considered a potentially significant, though temporary, effect. Mitigation is proposed. Even with mitigation, however, there is the potential for individual

mortality of listed fish species and harassment of marine mammals immediately adjacent to pile-driving activity, and this impact is considered significant and unavoidable, if pile-driving is used. It should be noted that the project would result in an increase in tidal marsh habitat, including subtidal channels that would provide rearing habitat for both listed and common fish species that currently use San Pablo Bay.

As described in the *Visual Aesthetics* section of chapter 4, with the changes in levee location and height included in Revised Alternative 2, the visual impacts of the new levees constructed under that alternative are considered less than significant. Alternatives 1 and 3 would include construction of a new levee much closer to the BMK south lagoon and with a higher initial construction height than the levee that would be constructed under Revised Alternative 2. Unless the changes in levee elevations and locations from Revised Alternative 2 were incorporated into Alternatives 1 and 3, these alternatives would have a significant and unavoidable visual impact.

Irreversible and Irretrievable Commitment of Resources

The proposed BMKV expansion would result in the irretrievable commitment of fossil fuels and other energy sources needed to build, operate, and maintain the wetlands. The proposed wetland restoration, however, is not considered an irreversible commitment because the landscape could be converted for other land uses in the future. The BMKV expansion does not involve converting the land for urban land uses, which tends to be irreversible.

Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the environment that would occur with restoration include the impacts on existing wetlands and habitat. As discussed in chapter 4, construction would result in the loss of wetland and upland habitat that presently exists at the BMKV expansion site. However, in the long term, the site is expected to be substantially more productive for fish and wildlife and associated habitat values, through the restoration of tidal wetlands and other habitats on-site.

The timeframes for construction of the different alternatives vary, as well as the expected timeframe to the establishment of wetland habitats on the site. Alternative 1 and Revised Alternative 2 both involve the placement of substantial amounts of dredged material and the overall construction period associated with these alternatives could last up to 13 years. However, a phased approach will be

used, which will allow completion of restoration activities on individual tidal cells in advance of completion of restoration activities on the entire site, and the first tidal cell may be ready for opening to tidal action approximately 7 to 8 years after commencement of construction. Under Alternative 1 and Revised Alternative 2, low marsh would begin to establish first, with mid/high marsh beginning to establish approximately 10 years after opening the site to tidal action. Thus, from commencement of construction activities, which would affect existing habitats, mid/high marsh could begin to establish on the first cell approximately 17 to 18 years after commencement of construction, with mid/high marsh beginning to establish on the remainder of the site approximately 27 to 28 years after commencement of construction.

Under Alternative 3, the overall construction period (5 years) is shorter than the other two alternatives, but due to a reliance primarily on natural sedimentation, wetland establishment will occur much more slowly with mudflats taking 5 years to establish; low marsh – 15 years; and mid-marsh – approximately 40 years. From the commencement of construction, it could take approximately 45 years to establish mid/high marsh. Thus, under Alternative 3, there would be a longer gap between the loss of existing habitat and the establishment of restoration habitat.

Public Issues, Public Involvement, and Areas of Controversy

Through a series of workshops in fall 2001 and a formal scoping meeting in December 2001, the lead agencies conferred with representatives from the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (DFG), Marin County Flood Control and Water Conservation District (MCFCWCD), Novato Sanitary District (NSD), City of Novato, County of Marin, Bel Marin Keys Community Services District (BMK CSD), and local residents.

Key issues of public concern reagarding the proposed BMKV expansion that were identified during the workshops and the scoping process include the following.

- Flood protection
- Drainage easements and agreements
- Public access/Bay Trail alignments
- Novato Creek sedimentation/dredging/navigation
- Effects on Pacheco Pond
- Levee protection and stability
- Existing wildlife habitats

- Buffers between residential and restoration area
- Compatibility of habitat and access components
- Novato Sanitary District outfall alignment
- Use/quality/handling of dredged material
- Hazardous waste

Appendix D describes the public involvement and scoping process and results in greater detail. All of the above-identified key public issues were discussed in the analysis of project effects included in the Draft SEIR/EIS document.

The Draft SEIR/EIS was released for agency and public review and comment on July 19, 2002. The comment period on the draft document was from July 19, 2002 to September 13, 2002. A public hearing to receive oral comment was held on August 21, 2002, in Novato, California. Written responses to all oral comments provided at the public hearing and all written comments received during the comment period that raised substantive issues were prepared. The comments and responses to the comments are provided in a separate volume. Key additional issues of public concern relevant to the Draft SEIR/EIS (beyond those noted above in scoping) that were raised during the public comment period include the following.

- Navigation in Novato Creek
- Flood insurance
- Scenic views from adjacent residences
- Traffic along Bel Marin Keys Boulevard
- Public health (particularly mosquito breeding habitat)

With the exception of flood insurance, all of these key issues were discussed in the Draft SEIR/EIS. Discussion of flood insurance has been added to the Final SEIR/EIS.

As noted in the responses to comments, several changes were made in the preferred alternative to avoid or reduce certain environmental effects or to further the project's goal and objectives (see discussion below). In addition, revisions have been made to the Draft SEIR/EIS to describe the changes in the preferred alternative, address concerns raised by comment, and make clarifications or add information requested by comment that is relevant to the assessment of environmental effects. None of the changes made to the Draft SEIR/EIS have resulted in new significant effects of the project that cannot be mitigated to a less-than-significant level or that significantly increase the severity of previously identified significant impacts.

Of the public issues raised to date, several may be identified as controversial by certain parties and are are described below.

- Flooding – As noted above, hydrologic and hydraulic studies conducted to support this SEIR/EIS identify that the preferred alternative would actually reduce peak stage in Pacheco Pond and would not result in increased flooding. Although some local residents questioned this conclusion in the Draft SEIR/EIS, no substantial evidence was raised in comment to warrant a change in this conclusion. Regarding flood insurance, because of the conclusion regarding flooding, no project-related change in offsite flood hazard zone mapping or flood insurance rates are expected.

- Flood zoning – The Corps and Conservancy have been conferring with MCFCWCD and other parties concerning the consistency of the proposed wetland restoration with the Marin County F-1 and F-2 zoning overlay designations of the BMKV site. Hydrologic and hydraulic analysis conducted for this document identified that the proposed wetland restoration would not have a physical adverse effect on flooding in neighboring areas. The MCFCWCD has not yet formally determined whether the project is or is not consistent with the requirements of the flood zoning ordinances. Pursuant to an Agreement with the Conservancy, MCFCWCD has requested an additional hydrologic and hydraulic study, which is being conducted. As of this SEIR/EIS, the Corps and Conservancy have determined that, even if the project were determined later to be inconsistent with the flood zoning requirement, this would not be a significant effect on the environment, as defined by CEQA and NEPA, because the project is not expected to result in an increase in flood risk to people or property. The Agreement established a process by which the Conservancy, the City of Novato, and MCFCWCD can resolve the zoning issues prior to construction. The Corps and Conservancy expect that the additional studies will confirm the studies conducted to support this SEIR/EIS, and that the flood zoning issues will be resolved to the satisfaction of all parties prior to construction

- Drainage easements and agreements – Some of the existing MCFCWCD drainage agreements will need to be amended to allow the project to go forward. The Conservancy is working with MCFCWCD to resolve the nature of the required amendments as part of the Agreement. The drainage easement with the BMK CSD for lagoon overflow from the south lagoon is accommodated by the preferred alternative.

- Novato Creek Navigation – The results of hydraulic assessment conducted for the SEIR/EIS have not identified a significant adverse effect of the preferred alternative on Novato Creek morphology or navigation. The SEIR/EIS concludes that the preferred alternative would result in an incidental navigation benefit to the lower Novato Creek channel due to the addition of tidal prism below the proposed levee breach.

- Bay Trail routing – The different alternatives presented in this document for the Bay Trail and potential trail options frame a range of possible routes. Agency and public opinion on the tradeoffs of public access, wildlife protection, and proximity to private residences often diverge. However, the SEIR/EIS provides a reasonable range of alternatives and options for consideration by the lead agencies when making decisions regarding the

selection of the preferred alternative. Further, changes have been made in the preferred alternative in response to a number of the access concerns raised in comment.

Selection of the Preferred Alternative

As noted in the Draft SEIR/EIS, the Corps had tentatively recommended Alternative 2 as the preferred alternative. After a review of the Draft SEIR/EIS analysis; the comments received from agencies, the public, and interested organizations; the response to comments presented in this document; the revised analysis in the Final SEIR/EIS; and a review of the project goals and objectives; the Corps and Conservancy decided to incorporate certain changes in Alternative 2 to address concerns raised in comment and to further the project goal and objectives. These revisions are described in greater detail in chapter 3. With these revisions to Alternative 2, the Corps and Conservancy determined that this alternative best meets the project goal and objectives, is responsive to a number of concerns raised by the local community, has incorporated feasible mitigation where significant effects have been identified. Alternative 2 is therefore selected as the preferred alternative. In addition, Alternative 2 is also considered the environmentally superior alternative based on the environmental analysis contained in the SEIR/EIS and on an evaluation of the estimated habitat benefits.

The Corps objective in ecosystem restoration planning is to contribute to national ecosystem restoration through increases in the net quantity and/or quality of desired ecosystem resources. Each alternative plan is to be formulated in consideration of four criteria: completeness, effectiveness, efficiency and acceptability. In addition, four accounts are established to facilitate evaluation and display the effects of alternative plans. For single-purpose ecosystem restoration projects such as the Bel Marin Keys Unit V Expansion of Hamilton Wetlands Restoration Project, these four accounts are National Ecosystem Restoration (NER), Environmental Quality (EQ), Regional Economic Development (RED) and Other Social Effects (OSE). The NER plan is identified by the Federal government as the plan that reasonably maximizes ecosystem restoration benefits compared to costs, consistent with the Federal objective. It is cost-effective and justified to achieve the desired level of outputs. Measurement of NER is based on changes in ecological resource quality as a function of improvement in habitat quality and/or quantity. These net changes are measured in the planning area and in the rest of the Nation. The EQ account displays non-monetary effects on significant natural and cultural resources. The RED account registers changes in the distribution of regional economic activity that result from each alternative plan. The OSE account registers plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts. The rationale for the Corps' recommendation is explained in greater detail in the Final General Reevaluation Report (GRR), in a separately bound volume, which is available at the repository libraries and locations noted in Chapter 7.

The following section provides a comparative discussion of the degree to which the different restoration alternatives meet the project goal and objectives.

Diverse Array of Habitats

Goal: *The goal of the proposed BMKV expansion is to create a diverse array of wetland and wildlife habitats at the BMKV and HAAF sites that benefit endangered species as well as other migratory and resident species.*

All 3 alternatives would provide an array of habitats that would benefit sensitive tidal-wetland-dependent species, migratory birds, and other species. Revised Alternative 2 would provide the greatest diversity of habitats by type because it includes tidal wetlands (899 acres), seasonal wetlands (277 acres), emergent wetlands (12 acres), open water habitat (21 acres) and upland habitat (247 acres), and because it provides more non-tidal wetlands than the other alternatives. Alternative 1 would provide more tidal wetlands (1,039 acres) and upland habitat (300 acres), and a slightly larger pond expansion (40 acres) than Revised Alternative 2, but far less seasonal wetlands (40 acres). Alternative 3 would provide the greatest amount of tidal wetland habitat (1,274 acres), but far less upland (55 acres) and seasonal wetlands (10 acres) than Revised Alternative 2. While Alternative 3 would provide the greatest amount of overall restored wetland habitat (1,284 acres), it would be the least diverse because of the dominance of tidal wetland. The timeframe for establishing elevations suitable for mid-to high-tidal marsh establishment under Alternative 3 is approximately 30 years slower than under Alternatives 1 and 2, which employ dredged material placement.

Management Considerations

Objective: *To design and engineer a restoration project that stresses simplicity and has little need for active management.*

All 3 alternatives require maintenance of new and existing levees. It is presumed that the BMK CSD would continue to maintain the BMK south lagoon levee. All 3 alternatives would require periodic maintenance of the various water management structures. Alternative 1 and Revised Alternative 2 would also require periodic maintenance of the overflow structures from the BMK south lagoon levee. Alternative 3 would require maintenance and periodic operation of a relief pump. The Bay Trail, trail spurs (if built), and interpretive center/access area would also require periodic maintenance.

Alternative 1 and Revised Alternative 2 are considered roughly equivalent in the amount of maintenance they are likely to require. Alternative 3 is considered to require a greater amount of active management because of the use of mechanical pumping for overflow relief from the BMK south lagoon.

Beneficial Use of Dredged Material

Objective: *To demonstrate the beneficial use of dredged material, if feasible.*

Alternative 1 and Revised 2 use approximately the same amount of additional dredged material (13 - 14 million cubic yards) and are considered equivalent in meeting this objective. Restoration of wetlands under Alternative 3 is based on the process of natural sedimentation in the BMKV site. Alternative 3 would not require the use of dredged material on the BMKV site, would result in less dredged material being placed on the SLC parcel than currently envisioned in the HWRP, and thus does not meet this objective. Under any alternative, dredged material would continue to be used at the HAAF parcel, as authorized in the HWRP.

Site Opportunities and Constraints

Objective: *To recognize existing opportunities and constraints, including the runway and remediation of contaminated areas of the HWRP, as integral components of design.*

Site opportunities and constraints were considered in the site design for all alternatives.

Key opportunities at the BMKV site include the following.

- *Use of dredged material to accelerate wetland formation* – Implementation of the LTMS calls for the beneficial reuse of dredged material, and Alternatives 1 and 2 would facilitate this reuse on the BMKV site. Alternative 3 would not.
- *Hydrological linkage of restored wetlands to adjacent water bodies* – All alternatives would reestablish a hydrological link between Pacheco Pond and wetlands on the BMKV site. All alternatives include establishment of a tidal connection to San Pablo Bay. Alternative 1 and Revised Alternative 2 of the alternatives include establishing a hydrological link to Novato Creek. Alternative 1 and Revised Alternative 2 are considered to incorporate this opportunity better than Alternative 3.
- *Integration of the Expansion Area into the HWRP* – The authorized HWRP includes a perimeter levee on the north side of the HWRP to separate it from the BMKV site. Expanding the HWRP to include the BMKV site would eliminate the need for a separating levee between the SLC parcel and BMKV site. A reconstructed berm would be necessary between the BMKV site and HAAF parcel to allow for maintenance and emergency access for the NSD outfall pipeline, but it would not need to be constructed as a flood control levee. This would engender a cost savings for the HWRP. All alternatives

would allow for the elimination of the separating levee between the SLC parcel and the BMKV site.

- *Extension of the Bay Trail* – The alternatives include several different routings that would facilitate the extension of the Bay Trail from the authorized HWRP to Bel Marin Keys Boulevard. Therefore, all of the alternatives incorporate this opportunity.

Key constraints at the BMKV site include the following.

- *Flood Easements and Zoning* – As noted above, the BMKV site has several recorded flood easements and is zoned as a flood overflow area. All of the alternatives would enhance flood storage of Pacheco Pond. The hydrology and hydraulic analysis conducted as part of the preparation of this document did not identify adverse physical effects of the restoration alternatives on flooding related to adjacent properties. While none of the alternatives would result in increased flooding, Revised Alternative 2 provides for a greater amount of ponding capacity connected to Pacheco Pond and to the BMK south lagoon than either Alternative 1 or 3. While the zoning and easements are still being resolved in coordination with MCFCWCD, because of the greater retained ponding capacity in Revised Alternative 2, this alternative may be more favorably reviewed during resolution of the zoning and easement requirements.
- *Availability of Dredged Material* – The recent increase in wetland projects dependent upon the use of dredged material for wetland restoration means that there may be a lack of available dredged material in the future. Although this is not currently considered a constraint on development of the HWRP or the BMKV expansion, Alternative 1 and Revised Alternative 2 employ a phasing concept wherein portions of the site can be restored in phases, which allows for the use of varying amounts of available dredged material.
- *NSD* – NSD has an existing outfall on the BMKV site. All of the alternatives include either retrofitting the existing outfall or placing a replacement outfall pipeline, mostly along the existing alignment to accommodate this use.
- *SLC Parcel* – Studies have identified soil contamination at several locations on the SLC parcel, which is part of the authorized HWRP. The SLC parcel will be remediated to a level suitable for wetland reuse through the separate FUDS process. Integration of wetland restoration at the BMKV site with the authorized project on the SLC parcel could result in tidal channel formation across areas that currently contain contaminated soil. While remediation of these sites is not part of the BMKV expansion, all of the alternatives would include the additional placement of dredged material on the southeast corner of the SLC parcel to reduce the potential for channel formation across areas where the selected remedial option may include leaving contaminated soil in place.

No Net Loss of Wetland Habitat at the BMKV and HAAF Sites

Objective: *To ensure no net loss of the wetland habitat presently at the BMKV and HAAF sites.*

All 3 alternatives would result in the restoration of tidal wetlands and associated habitat functions, but would also result in the temporary loss of seasonal wetlands and a decrease in agricultural wetlands.

Under Alternative 1, it is presumed that the replacement of existing wetland habitat value will be through the in-kind value of new freshwater emergent wetlands (10 acres), seasonal wetlands (40 acres), and the out-of-kind value of the tidal marsh (1,039 acres). Under Alternative 3, it is presumed that the replacement of existing habitat value would be through the in-kind value of new freshwater emergent wetlands (10 acres), seasonal wetland (10 acres), and the out-of-kind value of the tidal marsh (1,274 acres).

Under Revised Alternative 2, the replacement of existing wetland habitat value relies much more on in-kind value than under the other two alternatives. It is presumed that the replacement of existing habitat value will be through the in-kind value of seasonal wetlands (277 acres) and emergent marsh habitat (12 acres), as well as through the out-of-kind value of tidal marsh (899 acres). A greater reliance on in-kind replacement of existing wetland habitat indicates that Revised Alternative 2 better meets the no-net loss objective.

Final conclusions about the habitat values of the restored areas of the BMKV expansion compared to the existing habitats will be made when the Coordination Act Report (CAR) is completed with the supporting Habitat Evaluation Procedure (HEP) study. The CAR is being prepared by USFWS in cooperation with the Corps and in compliance with the Fish and Wildlife Coordination Act. The act requires federal agencies to coordinate with USFWS regarding impacts of any federal project on fish and wildlife. HEP is a method of quantifying an index value to compare the relative values of existing and future habitats.

Creation and Maintenance of Wetland Habitats that Support Bay Area Special-Status Species

Objective: *To create and maintain wetland habitats that sustain viable wildlife populations, with particular emphasis on supporting Bay Area special-status species.*

Habitat types created under all alternatives include subtidal channel, tidal mudflat, low marsh, tidal marsh, high transitional marsh, seasonal wetland, emergent marsh, open water, and upland. As described above, it is estimated that

80 to 90 percent of the tidal wetlands in San Francisco Bay have been lost, and tidal wetlands support several special-status species, including the listed California clapper rail and the salt marsh harvest mouse. Alternative 1 would create approximately 1,039 acres of tidal wetland compared to 899 acres under Revised Alternative 2. Alternative 3 would create a larger amount of tidal wetland (1,274 acres), but would take approximately 30 years longer than the other two alternatives to establish. Several special-status species also use seasonal wetland. Alternative 1 would include 40 acres of seasonal wetland, Revised Alternative 2 would include 277 acres of seasonal wetland, and Alternative 3 would include 10 acres of seasonal wetland.

Alternative 3 best meets the objective in terms of creating new tidal habitat to support listed species, and Revised Alternative 2 best meets the objective in terms of creating seasonal wetlands to support other sensitive species. Alternative 1 also meets this objective, though with a different habitat mix. Overall, all 3 alternatives are considered to meet this objective, though with different mixes of habitats.

There would be no routine maintenance required for any created tidal habitats after breaching. Maintenance of water structures would be required in order to ensure that the new seasonal wetland habitats receive water and the site drainage performs as designed. As noted above, Alternative 3 would require maintenance of the pumping station, although this would be performed for flood relief, not for habitat maintenance.

Buffers between Wildlife and Adjacent Land Uses

Objective: *To include buffer areas along the upland perimeter of the project area, especially adjacent to residential areas, so wildlife will not be impacted by adjacent land uses.*

Alternative 1 and Revised Alternative 2 provide upland buffers between the restored wetlands and the BMK residential area, in addition to the BMK south lagoon itself. However, Revised Alternative 2 includes a larger swale area with a greater separation between the tidal restoration area (which would be the most sensitive habitat on the future site because of its likely use by listed species) and the BMK residential area, and meets this objective better than Alternative 1.

Under Alternative 3, the only buffers between the restored tidal wetland area would be the south lagoon levee and the new levee constructed immediately south of the south lagoon levee, and this alternative therefore only partially meets the buffer objective.

Compatibility with Adjacent Land Uses and Wildlife Habitats

Objective: *To be compatible with adjacent land uses and wildlife habitats.*

Land uses adjacent to the wetland restoration site include residential development, open space (Pacheco Pond), and Novato Creek and San Pablo Bay.

Alternatives 1 and 3 both include new levees that were determined in the Draft SEIR/EIS to have a significant effect on existing residential views of the site. Revised Alternative 2 includes new levees that would be located further from the adjacent residential views and would have lower construction heights; these levees would have less-than significant aesthetic impacts.

Alternatives 1 and 3 both include a spur trail along the new levees to Novato Creek. Numerous residents in the BMK residential community objected to the potential for a spur trail. No spur trail is included in Revised Alternative 2. Alternative 3 includes an interpretive center/access area adjacent to the western part of the BMK residential area; this location was also opposed in numerous resident comments. In the preferred alternative, the center/access area was moved to the property currently owned by the City of Novato adjacent to HAAF.

Wildlife habitats adjacent to the BMKV site include the outboard tidal marsh and tidal flat areas in San Pablo Bay and Novato Creek, the restoration area at the HAAF and SLC parcels, and the brackish open water and wetland habitats in Pacheco Pond. The restoration alternatives would enhance the value of the adjacent tidal habitat areas by adding substantial acreage of tidal habitat. The hydrologic connections to Pacheco Pond will be designed in conjunction with development of a water management plan to maintain the flood control and wildlife habitat purposes of the pond.

Regarding wildlife habitat, all alternatives are considered compatible with adjacent habitats. Regarding adjacent land uses, Revised Alternative 2 is more compatible with adjacent residential uses in Bel Marin Keys than Alternatives 1 and 3.

Public Access Compatible with Protection of Resource Values

Objective: *To provide for public access that is compatible with the protection of resource values and with regional and local public access policies.*

Public access to the expansion site would be provided under all 3 alternatives. All alternatives include consideration of resource protection in development of the final design of trails, as well as a trail management plan. Specific mitigation

approaches are included in this SEIR/EIS to reduce impacts of Bay Trail access on wildlife under each alternative.

The design and management of the Bay Trail route under Alternative 1 west of Pacheco Pond would require more detailed mitigation for the protection of resource values because of the trail's proximity to the riparian area at the confluence of Arroyo San Jose and Pacheco Creek and directly adjacent to Pacheco Pond. A trail around the west side of Pacheco Pond is also not consistent with the preferred alignments in City of Novato and Marin County general plans.

The design and management of the spur trails included in Options 1A and 3A would require more detailed and rigorous mitigation for the protection of resource values because of the trail's proximity to the tidal marsh restoration area and Novato Creek. While the spur trails are not specifically included in local planning, neither are they excluded. Greater management of the spur trails included in Alternatives 1 and 3 would likely be necessary because the trails would provide public access to Novato Creek and they would be in close proximity to habitat supporting listed species.

Revised Alternative 2 is consistent with local planning and avoids the impacts of opening public access to Novato Creek (as under Alternatives 1 and 3) and to areas adjacent to tidal restoration areas (as under Alternatives 1 and 3), or of opening public access through the riparian confluence area and immediately adjacent to Pacheco Pond (as under Alternative 1). Therefore, Revised Alternative 2 is considered to best meet this objective.

Table ES-2. Summary of Impacts and Mitigation Measures

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Geology, Soils, and Seismicity			
No-Action Alternative			
Impact G-1: Continued Land-Surface Settlement, Substantial Alteration of Natural Topography, and Loss of Soil Resources Capable of Supporting Sensitive Wetland Habitats	No Impact		
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact G-2: Settlement of Proposed Levees, Uplands, Seasonal Wetlands, and Tidal Wetlands in Response to the Placement of Static Fill Loads	Less than Significant		
Impact G-3: Potential Levee Slope Failure Resulting from the Low Shear Strength of Underlying Bay-Mud Deposits	Less than Significant		
Impact G-4: Potential Short-Term Increase in Erosion and Sedimentation Rates During Project Construction	Less than Significant		
Impact G-5: Potential Damage to Proposed Levees Resulting from Earthquake-Induced Ground Shaking and Lurch Cracking	Less than Significant		
Impact G-6: Potential Exposure of Levees and Sensitive Wetlands to Tsunamis or Seiches	Less than Significant		
Surface Water Hydrology and Tidal Hydraulics			
No-Action Alternative			
No impacts.			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact HYD-1: Potential for Change in Peak Stage in Pacheco Pond	Beneficial		
Impact HYD-2: Potential Change in Pacheco Pond Peak Stage	Beneficial		

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact HYD-3: Potential Increases in Pacheco Pond Overflows into the Leveroni Property	Beneficial		
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact HYD-4: Potential Increases in Novato Creek Flood Stage	Beneficial		
Impact HYD-5: Potential Change in Drainage Capacity from the Bel Marin Keys Lagoons	Beneficial		
Impact HYD-6: Potential Increases in Tidal Flooding	Less than Significant		
Impact HYD-7: Potential Inconsistency with Flood Zoning	Less than Significant		
Impact HYD-8: Potential Conflict with Existing Drainage Agreements	Less than Significant		
Impact HYD-9: Potential Changes in Flood Zone Mapping and Flood Insurance	Less than Significant		
Impact TH-1: Modification to Circulation in San Pablo Bay	Less than Significant		
Impact TH-2: Changes in Circulation and Morphologic Evolution in Existing Tidal Wetlands	Significant	Mitigation Measure BIO-7: Monitor Site Development and Implement Actions to Increase the Rate of Marsh Development, if Required	Less than Significant
Impact TH-3: Potential Changes in Lower Novato Creek Morphology due to Relocation of Pacheco Pond Outlet	Less than Significant		
Impact TH-4: Potential Changes in Pacheco Pond Outlet Channel due to Diversion of Outlet Flow	Less than Significant		
Impact TH-5: Outboard Marsh Shoreline Erosion	Less than Significant		
Impact TH-6: Excessive or Unexpected Erosion of Perimeter Levees	Less than Significant		
Impacts and Mitigation Measures Common to Alternative 1 and Revised Alternative 2			
Impact TH-7: Modification to Sedimentation Processes and Morphology in San Pablo Bay	Less than Significant		

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact TH-8: Modifications to Sedimentation Processes and Morphology of Novato Creek due to Breach of BMKV/Novato Creek Levee	Less than Significant		
Impact TH-9: Potential Increase in Existing Levee Erosion on Novato Creek	Less than Significant		
Impact TH-10: Modification to Circulation in Novato Creek	Less than Significant		
Impacts and Mitigation Measures Unique to Alternative 3			
Impact TH-11: Modification to Sedimentation Processes in San Pablo Bay	Significant	Mitigation Measure TH-1: Perform an Assessment of Modifications to Sedimentation Processes in San Pablo Bay for Alternative 3 and Implement Phased Tidal Cell Development, if Necessary	Less than Significant
Water Quality			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact WQ-1: Potential for Degradation of Surface Water and Sediment Quality due to Increased Methylmercury Formation Potential	Potentially Significant and Unavoidable	Mitigation Measures WQ-1: Implement Methylmercury Adaptive Management Plan	Potentially Significant
Impact WQ-2: Potential Degradation of Groundwater Quality	Less than Significant		
Impact WQ-3: Potential for Degradation of Water Quality in Restored Wetlands from NSD discharges	Less than Significant		
Impact WQ-4: Beneficial Increases in Dissolved Oxygen Concentration in Receiving Waters	Beneficial		
Impact WQ-5: Potential Exceedance of Water Quality Objectives due to Inadequate Flushing in Restored Wetlands	Less than Significant		
Impact WQ-6: Potential Diesel Pump Spills into San Pablo Bay	Significant	Mitigation Measure WQ-2: Provide for Spill Protection at Offloader and at Booster Pump Facility	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact WQ-7: Potential for Changes in Salinity Levels within Novato Creek	Less than Significant		
Impact WQ-8: Potential Changes to Circulation in Pacheco Pond	Significant	Mitigation Measure WQ-3: Incorporate Pacheco Pond Water Quality Concerns Regarding Circulation in New Water Management Plan, in Cooperation with MCFCWCD and CDFG.	Less than Significant
Impacts and Mitigation Measures Common to Alternative 1 and Revised 2			
Impact WQ-9: Potential for Degradation of Receiving Water Quality due to Dredged Material Placement	Significant	Mitigation Measure WQ-4: Develop and Implement Water Quality Monitoring Program for Dredged Material Placement.	Less than Significant
Impacts Unique to Alternative 3			
Impact WQ-10: Potential for Spills from Fueling of Pump(s) at Pump Station	Significant	Mitigation Measure WQ-5: Provide for Spill Protection at Pump Station.	Less than Significant
Public Health			
No Action Alternative			
No impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact PH-1. Increase of Potential Mosquito Breeding Habitat	Significant	Mitigation Measure PH-1: Coordinate Restoration Design and Expansion Activities with MSMAD	Less than Significant
Biological Resources			
No-Action Alternative			
No Impact			

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact BIO-1: Increase in Subtidal Aquatic Habitat for Resident and Anadromous Fish	Beneficial		
Impact BIO-2: Short-Term Loss of or Disturbance to and Long-Term Increase in Intertidal Mudflats	Less than Significant		
Impact BIO-3: Temporary Disturbance to the Northern Harrier, White-Tailed Kite, Golden Eagle, Cooper's Hawk, Sharp-shinned Hawk, Short-Eared Owl, Burrowing Owl, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow During Construction	Significant	Mitigation Measure BIO-1: Conduct Surveys to Locate Northern Harrier, White-Tailed Kite, Golden Eagle, Cooper's Hawk, Sharp-shinned Hawk, Short-Eared Owl, Burrowing Owl, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow Nest Sites Before Construction Is Initiated and Avoid Breeding Sites	Less than Significant
Impact BIO-4: Potential for Construction-Related Mortality of Salt Marsh Harvest Mice	Significant	Mitigation Measure BIO-2: Remove Salt Marsh Harvest Mouse Habitat and Place Barrier Fencing in the Immediate Vicinity of Operating Equipment.	Less than Significant
Impact BIO-5: Potential for Construction-Related Mortality of California Clapper Rails and California Black Rails	Significant	Mitigation Measure BIO-3: Avoid Operation of Equipment within 250 feet of the Outboard Tidal Coastal Marsh During the Breeding Period of the California Clapper Rail and California Black Rail	Less than Significant
Impact BIO-6: Potential for Mortality of San Pablo Song Sparrows	Significant	Mitigation Measure BIO-4: Conduct Surveys to Locate San Pablo Song Sparrow Nest Sites before Construction Is Initiated and Avoid Breeding Sites	Less than Significant
Impact BIO-7: Potential for Mortality of Burrowing Owls	Significant	Mitigation Measure BIO-5: Conduct Surveys to Locate Burrowing Owl Nest Sites before Construction Is Initiated and Avoid Breeding Sites	Less than Significant
Impact BIO-8: Potential for Construction-Related Mortality of Outmigrating Salmonid Smolts	Significant	Mitigation Measure BIO-6: Avoid Construction that Could Affect Tidal Aquatic Habitats when Salmonid Smolts Could Be Present	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-9: Potential for Reduced Access to Freshwater Habitat for Anadromous Salmonids	Less than Significant		
Impact BIO-10: Potential Disturbance to or Mortality of Special-Status Species Resulting from Monitoring and Adaptive Management Activities	Significant	Mitigation Measure BIO-7: Develop and Implement a Restoration Monitoring and Adaptive Management Program Designed to Minimize Potential Impacts on Special-Status Species.	Less than Significant
Impact BIO-11: Loss of Refugia for the California Clapper Rail, California Black Rail, and Salt Marsh Harvest Mouse	Less than Significant		
Impact BIO-12: Increase in Suitable Habitat for the Brown Pelican and Double-Crested Cormorant	Beneficial		
Impact BIO-13: Increase in Suitable Nesting Habitat for Resident Waterfowl	Beneficial		
Impact BIO-14: Loss of Coastal Salt Marsh	Significant	Mitigation Measure BIO-8: Monitor Site Development and Implement Actions to Increase the Rate of Marsh Development, If Required	Less than Significant
Impact BIO-15: Loss of Brackish Open Water Habitat and Brackish Marsh	Significant	Mitigation Measure BIO-9: Monitor Development of Brackish Open Water, Emergent Marsh, and/or Seasonal Wetlands.	Less than Significant
Impact BIO-16: Loss of Seasonal Wetlands	Less than Significant		
Impact BIO-17: Loss of Agricultural Wetlands	Less than Significant		
Impact BIO-18: Loss of Grassland at BMKV Site	Less than Significant		
Impact BIO-19: Loss of Habitat for California Clapper Rail, California Black Rail, Salt Marsh Harvest Mouse, and Saltmarsh Common Yellowthroat	Significant	Mitigation Measure BIO-8: Monitor Site Development and Implement Actions to Increase the Rate of Marsh Development, if Required	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-20: Temporary Loss of Nesting Habitat for the San Pablo Song Sparrow	Significant	Mitigation Measure BIO-8: Monitor Site Development and Implement Actions to Increase the Rate of Marsh Development, if Required Mitigation Measure BIO-9: Monitor Development of Brackish Open Water, Emergent Marsh, and/or Seasonal Wetlands.	Less than Significant
Impact BIO-21: Temporary Loss of Nesting and/or Foraging Habitat for the Northern Harrier, White-Tailed Kite, and Short-Eared Owl	Less than Significant		
Impact BIO-22: Loss of Foraging Habitat for Golden Eagle and Burrowing Owl	Less than Significant		
Impact BIO-23: Temporary Loss of Foraging Habitat for Wintering Waterfowl	Less than Significant		
Impact BIO-24: Increase in Suitable Habitat for Migratory Shorebirds	Beneficial		
Impact BIO-25: Potential for spread of invasive nonnative plants within and outside of restoration area during construction activities	Significant	Mitigation Measure 10a: Prevent Spread of Perennial Pepperweed and Other Invasive Weeds to Uninfested Areas Mitigation Measure 10b: Monitor Restoration Sites and Control for Infestation by Invasive nonnative plants	Less than Significant
Impact BIO-26: Biological Benefit from Increases in Organic Carbon and Nitrogen Concentrations	Beneficial		
Impact BIO-27: Disruption of Sensitive Wildlife due to Bay Trail Construction, All Alternatives	Significant	Mitigation Measure BIO-1: Conduct Surveys to Locate Northern Harrier, White-Tailed Kite, Golden Eagle, Cooper's Hawk, Sharp-shinned Hawk, Short-Eared Owl, Burrowing Owl, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow Nest Sites Before Construction Is Initiated and Avoid Breeding Sites	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-28: Disruption of Sensitive Wildlife due to Public Access Interactions along the Bay Trail	Significant	Mitigation Measure BIO-11: Incorporate Wildlife-Sensitive Approaches in Bay Trail Design and Develop Trail Access Management Plan	Less than Significant
Impact BIO-29: Disruption of Sensitive Wildlife due to Public Access Interactions along the Bay Trail, Southward and Northward Extension	Significant	Mitigation Measure BIO-12: Implement Specific Design and Management Mitigation for Bay Trail Southward Extension and Northward Extension from City of Novato Levee	Less than Significant
Impact BIO-30: Changes in Predator Access	Less than Significant		
Impact BIO-31: Potential Harm to Marine Mammals, and Special-Status Fish Species, and Common Fish Species due to Pile-Driving Activities for Off-Loader Facility and Booster-Pump Platforms	Significant and Unavoidable	Mitigation Measure BIO-13: Coordinate with Appropriate Federal and State Agencies to Reduce Impact on Marine Mammals and Special-Status Fish Species during Pile-Driving Activities	Significant
Impact BIO-32: Potential Disruption to Nesting Special-Status and Common Birds due to Removal of Several Eucalyptus Groves and Several Oak Trees	Significant	Mitigation Measure BIO-14: Remove Identified Eucalyptus Groves and Oak Trees outside Special-Status and Other Bird Breeding Seasons	Less than Significant
Impact BIO-33: Potential Disruption to Special-Status Bat Species due to Removal of Structures	Significant	Mitigation Measure BIO-15: Conduct Site Surveys for Presence of Special-Status Bat Species and Remove Structures in accordance with State and Federal Laws.	Less than Significant
Impact BIO-34: Loss of Agricultural Land	Less than Significant		
Impact BIO-35: Potential Change in Habitats in Pacheco Pond and Tributaries	Less than Significant		
Impacts and Mitigation Measures Common to Alternative 1 and Revised Alternative2			
Impact BIO-36: Potential Effects of Construction of and Access to the Interpretive Center and Access Area on the “Bulge” Parcel West of the HWRP	Significant	Mitigation Measure BIO-16: Recommended Mitigation Measures for Construction of and Access to and from the Interpretive Center and Access Area on the “bulge” parcel west of HWRP.	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-37: Potential for Construction-Related Mortality of Chinook Salmon, Central Valley Steelhead, and Longfin Smelt	Less than Significant		
Impact BIO-38: Temporary Disturbance of Fish in San Pablo Bay During Construction	Significant	Mitigation Measure BIO-17: Use Fish Screens to Prevent Possible Entrainment of Fish	Less than Significant
Impacts and Mitigation Measures Unique to Alternative 1			
Impact BIO-39: Disruption of Sensitive Wildlife due to Bay Trail Construction, Alternative 1 and Spur Option 1A	Significant	Mitigation Measure BIO-18: Mitigation for Construction of Trail West of Pacheco Pond. Mitigation Measure BIO-1: Conduct Surveys to Locate Northern Harrier, White-Tailed Kite, Golden Eagle, Cooper's Hawk, Sharp-shinned Hawk, Short-Eared Owl, Burrowing Owl, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow Nest Sites Before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-3: Avoid Operation of Equipment within 250 feet of the Outboard Tidal Coastal Marsh During the Breeding Period of the California Clapper Rail and California Black Rail and Avoid Breeding Sites during Construction Mitigation Measure BIO-5: Conduct Surveys to Locate Burrowing Owl Nest Sites before Construction Is Initiated and Avoid Breeding Sites during Construction	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-40: Disruption of Sensitive Wildlife due to Public Access Interactions along Bay Trail, Alternative 1	Significant	Mitigation Measure BIO-19a: Specific Design and Management Mitigation for Bay Trail Alternative 1 Mitigation Measure BIO-19b: Specific Design and Management Mitigation for Spur Option 1A Mitigation Measure BIO-12: Implement Specific Design and Management Mitigation for Bay Trail Southward Extension and Northward Extension from City of Novato Levee	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impacts and Mitigation Measures Unique to Revised Alternative 2			
Impact BIO-41: Disruption of Sensitive Wildlife due to Bay Trail Construction, Revised Alternative 2	Significant	Mitigation Measure BIO-1: Conduct Surveys to Locate Northern Harrier, White-Tailed Kite, Golden Eagle, Cooper's Hawk, Sharp-shinned Hawk, Short-Eared Owl, Burrowing Owl, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow Nest Sites Before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-3: Avoid Operation of Equipment within 250 feet of the Outboard Tidal Coastal Marsh During the Breeding Period of the California Clapper Rail and California Black Rail and Avoid Breeding Sites during Construction Mitigation Measure BIO-4: Conduct Surveys to Locate San Pablo Song Sparrow Nest Sites before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-5: Conduct Surveys to Locate Burrowing Owl Nest Sites before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-6: Avoid Construction that Could Affect Tidal Aquatic Habitats when Salmonid Smolts Could Be Present	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-42: Disruption of Sensitive Wildlife due to Bay Trail Access, Revised Alternative 2	Significant	Mitigation Measure BIO-12: Implement Specific Design and Management Mitigation for Bay Trail Southward Extension and Northward Extension from City of Novato Levee Mitigation Measure BIO-20: Implement Specific Design and Management Recommendations for Bay Trail Revised Alternative 2.	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impacts and Mitigation Measures Unique to Alternative 3			
Impact BIO-43: Disruption of Sensitive Wildlife due to Bay Trail Construction, Alternative 3 and Spur Option 3A	Significant	Mitigation Measure BIO-1: Conduct Surveys to Locate Northern Harrier, White-Tailed Kite, Golden Eagle, Cooper's Hawk, Sharp-shinned Hawk, Short-Eared Owl, Burrowing Owl, Saltmarsh Common Yellowthroat, and San Pablo Song Sparrow Nest Sites Before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-3: Avoid Operation of Equipment within 250 feet of the Outboard Tidal Coastal Marsh During the Breeding Period of the California Clapper Rail and California Black Rail and Avoid Breeding Sites during Construction Mitigation Measure BIO-4: Conduct Surveys to Locate San Pablo Song Sparrow Nest Sites before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-5: Conduct Surveys to Locate Burrowing Owl Nest Sites before Construction Is Initiated and Avoid Breeding Sites during Construction Mitigation Measure BIO-6: Avoid construction that could affect tidal aquatic habitats	Less than Significant

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-44: Disruption of Sensitive Wildlife due to Bay Trail Access, Alternative 3 and Spur Option 3A	Significant	Mitigation Measure BIO-21a: Specific Design and Management Mitigation for Bay Trail Alternative 3 Mitigation Measure BIO-21b: Specific Design and Management Mitigation for Trail Spur Option 3A Mitigation Measure BIO-12: Implement Specific Design and Management Mitigation for Bay Trail Southward Extension and Northward Extension from City of Novato Levee	Less than Significant
Land Use and Utilities			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact LU-1: Consistency with Applicable City and County General Plans and Policies	Less than Significant		
Impact LU-2: Compatibility with Designated Bay Trail Routes and Effects on Existing Informal Recreational Use	Less than Significant		
Impact LU-3: Conflict with Existing Utilities and Utility Easements	Less than Significant		
Impact LU-4: Conflict with Other Existing Easements	Less than Significant		
Impact LU-5: Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Non-Agricultural Use	Less than Significant		
Impacts and Mitigation Measures Common to Alternative 1 and Revised Alternative 2			
Impact LU-6: Modifications to Morphology of Novato Creek due to Breach of BMKV/Novato Creek Levee May effect Navigation	Beneficial		

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impacts and Mitigation Measures Unique to Alternative 3			
Impact LU-7. Inconsistency with the LTMS Management Plan	Potentially Significant	No feasible mitigation measures	Potentially Significant
Hazardous Substances and Waste			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact HAZ-1: Potential Exposure of Humans, Plants, or Wildlife to Contaminants as a Result of Remediation Activities for the Proposed Action	Significant	Mitigation Measure HAZ-1: Coordinate with Department of Toxic Substances Control on BMK Site Clean-Up Requirements prior to Construction	Less than Significant
Impact HAZ-2: Potential Exposure of Humans, Plants, or Wildlife to Hazardous Chemicals Contained in Dredged Material Used as Fill Material	Potentially Significant (See Impact WQ-1)	Mitigation Measures WQ-1: Implement Methylmercury Adaptive Management Plan	Potentially Significant
Impact HAZ-3: Potential Exposure of Humans, Plants, or Wildlife to Hazardous Chemicals Due to Sedimentation from Novato Creek and/or San Pablo Bay	Potentially Significant (See Impact WQ-1)	Mitigation Measures WQ-1: Implement Methylmercury Adaptive Management Plan	Potentially Significant
Transportation			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact T-1: Change in LOS at Important Intersections and Roadway Segments during the Construction Phase	Less than Significant		
Impact T-2: Change in LOS at Important Intersections and Roadway Segments during the Operation Phase	Less than Significant		

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Air Quality			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact A-1: Construction-Related Emissions of PM10 from Terrestrial Construction Equipment	Significant	Mitigation Measure A-1: Control PM10 Emissions in Accordance with BAAQMD Standards	Less than Significant
Impact A-2: Construction-Related Emissions of Ozone Precursors from Terrestrial Equipment and Use of Diesel Pumps to Offload Dredge Material	Significant	Mitigation Measure A-2: Control and/or Offset NOx Emissions Associated with Unloading of Dredged Material	Less than Significant
Impacts Unique to Alternative 3			
Impact A-3: Operational Emissions of a Relief Pump	Less than Significant		
Noise			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1-3			
Impact N-1: Potential Increases in Traffic Noise Levels	Less than Significant		
Impact N-2: Temporary Increases in Noise Levels to More Than 60 dBA during Onshore Construction	Significant	Mitigation Measure N-1: Employ Noise-Reducing Construction Practices	Less than Significant
Impact N-3: Temporary Increase in Noise Levels due to Offshore Pile-Driving	Less than Significant		
Impacts and Mitigation Measures Common to Alternative 1 and Revised Alternative 2			
Impact N-4: Increased Noise from Use of Hydraulic Off Loaders and Supplemental Booster Pumps	Less than Significant		

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impacts Unique to Alternative 3			
Impact N-5: Increased Noise from Use of Relief Pump(s)	Significant	Mitigation Measure N-2: Employ Noise-Reducing Design if the Pump Station in Alternative 3 is Built.	Less than Significant
Cultural Resources			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1–3			
Impact CR-1: No impact to known significant architectural or archaeological resources	No Impact		
Impact CR-2: Potential impacts to buried cultural deposits or human remains	Significant	Mitigation Measure CR-1: Stop Work if Buried Cultural Deposits Are Encountered during Construction Activities Mitigation Measure CR-2: Stop Work if Human Remains are Encountered during Construction Activities	Less than Significant
Impacts and Mitigation Measures Unique to Alternative 1			
Impact CR-3: Potential Cultural Resource impacts resulting from construction of the Bay Trail alignment, Alternative 1	Less than Significant		
Aesthetics			
No-Action Alternative			
No Impact			
Impacts and Mitigation Measures Common to Alternatives 1–3			
Impact AE-1: Change in Aesthetic Character of BMKV Site	Less than Significant		

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impacts and Mitigation Measures Unique to Alternative 1			
Impact A-2: Obstruction of Existing Unobstructed Views of BMKV Site and San Pablo Bay, Alternative 1	Significant and Unavoidable	No mitigation measures available, except changes to levee heights and location as in Revised Alternative 2.	Significant
Impacts and Mitigation Measures Unique to Revised Alternative 2			
Impact AE-3: Obstruction of Existing Views of BMKV Site and San Pablo Bay, Revised Alternative 2	Less than Significant		
Impacts and Mitigation Measures Unique to Alternative 3			
Impact A-4: Obstruction of Existing Views of BMKV Site and San Pablo Bay	Significant and Unavoidable	No mitigation measures available, except changes to levee heights and location as in Revised Alternative 2.	Significant